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ADHESIVE FOR PLASTER OF PARIS FOR BANDAGE USE

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This invention relates to a bandage for use in surgery, orthopedy and dermatology, and particularly one of the type wherein a flexible fibrous carrier is impregnated with a composition containing plaster of Paris together with an adhesive binder to prevent plaster loss.

Such a bandage is made usually in the form of a roll which, in use, is immersed in water to hydrate the plaster and, while still wet, wrapped around the member to be immobilized. During the wrapping process the bandage is molded to the shape of the member and rendered substantially homogeneous throughout by rubbing or handling. The bandage sets to form a hard and rigid structure.

Plaster of Paris bandages, as heretofore made, have not been entirely satisfactory. They sometimes lose as much as twenty-five per cent of the plaster during the immersion process and during application to the member to be immobilized. They require great care in handling to guard against telescoping, i. e., the tendency for the inner convolutions of the bandage to slip from within the outer convolutions as the bandage becomes thoroughly wetted. Where telescoping occurs, it is impossible to use a bandage in the manner intended.

In the improved bandage, telescoping, for all practical purposes, has been eliminated. It is unnecessary to use special precautionary techniques to guard against inter-layer slippage during immersion to saturate the bandage prior to use. During immersion, little or no plaster is lost and this is likewise true when the bandage is squeezed to expel excess water. The tests have shown that during the immersion and squeezing process the plaster lost from the improved bandage is in the neighborhood of 0.1%. It is true that as the bandage is molded on the member to be immobilized some plaster comes off on the operator's hands but this amounts to no more than about 3 to 5% of the total plaster in the bandage. Thus, about 94 to 96% of the original plaster in the bandage is delivered to the cast. The result is that more plaster per bandage is carried to the cast and fewer bandages are required for strong, dependable immobilization. To state the matter differently, bandages which initially contain a given amount of plaster produce a much stronger cast than earlier types of bandages containing initially a corresponding amount of plaster because of the excessive plaster loss suffered by the latter during application.

According to the present invention, the plaster of Paris (calcium sulfate hemi-hydrate) is held

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in place on the flexible carrier prior to use by an adhesive which is insoluble in water or at least insoluble to such an extent as not to swell or otherwise be affected materially in the period required to wet out the plaster. The adhesive is not present in the form of a film as in the case of the soluble adhesives that have heretofore been used, but rather is dispersed intermittently in the form of tiny discrete particles over the surface of the plaster particles binding them one to another and to the flexible carrier.

It has been discovered that the effect of the adhesive, in reducing plaster loss during the immersion process and eliminating telescoping during application to the member to be immobilized due to poor lamination, is governed by the quantity of adhesive used. Plaster of Paris bandages containing an adhesive, based on dry weight, in an amount within the range of from 0.1% to 2.5%, based on the dry weight of plaster of Paris, exhibit excellent laminating properties and, when used in the immobilization of body members, deliver to the cast approximately 94 to 96% of the original plaster in the bandage.

In the absence of a film or matrix in which the plaster of Paris particles otherwise would be embedded, there is nothing to delay or inhibit hydration when the bandage is immersed since during immersion the water will have immediate access to the hemi-hydrate particles. Furthermore, throughout the immersion process, the insoluble, or relatively insoluble discrete particles of adhesive will continue to perform their binding function. They enable excess water to be squeezed out without plaster loss so that the bandage will set and dry in the shortest possible period. Less adhesive is required than is the case if a continuous water soluble film is used.

In order to distinguish as a class the adhesive materials it is proposed to use, they have been termed, in the absence of a better name, "non-swellable" adhesives and they may be either insoluble in water or so slowly soluble in water as not to swell during the period of wetting out and application of the bandage as previously described. Among the materials in this category which may be used in practising the invention there are included the water insoluble polymers and copolymers of vinyl acetate and methacrylate or acrylate esters; water insoluble cellulosic ethers and esters; natural and synthetic rubbers; coumarone indene resins; rosins and those derivatives of rosin which are water insoluble. These materials are given by way of example only since, indeed, any adhesive which is water insoluble to